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the most of ten or eleven winters and have several times gone as high as 5,000 feet, but these higher ascents were only when there was but little snow. About the middle of November some years ago I was at the summit of the Central Pacific Railroad, altitude 7,000 feet. The ground was mostly bare and I saw only a few birds and fewer animals, the Little Chief hare being one of the latter. The reptiles and batrachians were sleeping their long annual sleep which covers fully two-thirds of the year at this height, and the sleep of the marmot and some of the small animals is nearly as long. A few asters and *Sidalcea* were in flower in protected situations.

Summit is a good locality for making winter observations but when the snow is from ten to twenty feet deep, as it usually is in winter, snow-shoes would be a necessary part of the observer's outfit and snow-blindness must be guarded against. I hope this mere outline of my experiences in collecting will interest the young ornithologists of the Academy, and in closing will say that, owing largely to the good influence of the Stanford and State Universities, scientific study is now much better appreciated by the people of California than it was when I began, in my crude way, to study ornithology.

### The Varied Thrush in Summer.

BY JOSEPH GRINNELL.

[Read before the Southern Division of the Cooper Orn. Club, Nov. 25, 1899.]

THE Varied Thrush (*Hesperocichla naevia*) is pre-eminently a bird of the West, being confined principally to the Pacific Coast from Alaska to California. It is a familiar winter visitant throughout the southern coast region, and here in Southern California it often appears in late fall in very large numbers in the foot-hills, feeding on the berries of the California holly. The summer home of this bird has been considered to be mainly north of the United States and chiefly within the heavily wooded Sitkan District, but ranging northward less commonly through the Yukon Valley. I found the Varied Thrush breeding in moderate numbers at Sitka, Alaska in the summer of '96. But I was rather surprised to find the species a much more numerous breeding bird in the Kowak Valley in northwestern Alaska, which is the extreme north of its range. In the spring of 1899 it appeared commonly in almost every tract of spruces, as near the coast of Kotzebue Sound as the first timber in the Kowak Delta, about ten miles east of Hotham Inlet. On May 28 I found it nest-building near upper timber-limit on the base of the Jade Mountains, on the northern border of the Kowak Valley and near the head of Hunt River.

At our winter camp which was lo-

cated near the confluence of Hunt River and the Kowak, about 175 miles east from the mouth of the latter, the first Varied Thrush arrived on the 21st of May, when the twanging notes of the males were heard several times during the morning and evening. The next day they had arrived in full force, and were to be seen and heard in every heavy stretch of woods. The snow had by this date nearly all disappeared, though the rivers and lakes were still covered with ice. Their food at this season consisted largely of wild cranberries and blueberries which were left from the previous summer's crop, and had been preserved under the winter snows. The birds were quite lively for members of the thrush tribe, which are usually of a quiet demeanor. When not feeding on the ground in one of the fruitful openings in the forest, they would be seen in wild pursuit of one another, either courting or quarrelling. The males were often seen in fierce combat, that is, fierce for a thrush. Of course some female ensconced in a thick evergreen in the vicinity was the cause of the dispute. I never saw just how a quarrel would commence. The swift pursuit would follow a tortuous route, twisting among the close-standing trees and across openings, so rapidly as to be difficult to follow with the eye. The

*finale* would be a short scrimmage among the thick foliage of a spruce, with a clatter of beating wings and a few sharp squeals like a robin's. They would fall slowly through the branches to the ground, when the contestants would separate, panting, and puffing out different parts of their plumage. The greatest apparent injury to either of the belligerents would be the loss of two or three feathers, yet one of them would consider himself fairly beaten, and soon retire, leaving the victor free to press his suit.

The song of the male Varied Thrush consists of a series of peculiar notes uttered slowly and at rather long intervals. Each note is complete in itself. It is a quavering *twang* with a faint rasping quality, the effect resembling the twang of a banjo string on a cracked bridge. These strange notes are produced in various keys, including a full octave, but the succession in which they are slowly uttered is irregular; a high note, then a low one, then a medium, with apparently no set arrangement. I have heard a single thrush from his secluded perch near the top of a dark evergreen, thus "sing" for twenty minutes at a time. It is an odd bird song, but when heard amid the solitude of the dark, damp spruce woods, it has an indescribably melancholy musical quality, which sets one to dreaming of far-away home. Many a half-hour have I spent lying on my back on some mossy hummock in the northern forest, spell-bound by this Mesmer of the woods. The ordinary call-note or note of warning of both male and female is a low liquid "quirt." It is heard quite frequently as one walks through the woods disturbing the thrushes, the sites of whose homes may be near by. In the Kowak Valley, I noticed the first signs of nest-building by the Varied Thrush, on the 25th of May, just four days after their arrival, and by the 28th nearly every pair were busy, for the summer is short and there is no loitering as in the case of many southern birds.

The female does all the work of constructing the nest, the male accompanying her constantly in her many trips after material, but as far as my observ-

ations go, never proffering any assistance. Many of the nests are built on those of the previous year as a foundation, and I even found three-storied nests. The old nests are flattened and dilapidated by the heavy August rains and winter snows, with the mud mostly dissolved out of them. During the winter a tour of the woods discloses hundreds of old thrushes' nests in various states of preservation, and in some sections nearly every tree harbors one or more. Where well-protected in dense spruce, they must survive many years. Probably the same pair of birds returns to a single nesting site for several successive seasons, especially if they raise their young there, unmolested. I found no evidence of any natural enemies of the Varied Thrush during the breeding season. The shrikes and small hawks seem to prey mainly on mice and lemmings with an occasional Redpoll.

All the nests of the Varied Thrush observed were in spruces, and varied in height above the ground from six to twenty feet, the latter being far above the average height which I should judge to be ten feet. Even in the tallest timber, the nesting sites are chosen in the lower foliage at a similar elevation. The parent birds are very solicitous about the safety of their homes, and the female, especially, exhibits great distress, when the nest is disturbed. The female performs the entire duty of incubation, at least I never discovered a male bird on the nest. The female sits very close, once remaining on the nest until I had climbed within a yard of her, and in this instance there were as yet no eggs in the nest. While one is near the nest, the female flies wildly around the tree at a short distance, uttering loud squeals and cries, much resembling those of the common robin. The male is less vehement in his protests and follows the movements of the female, but at a longer radius answering her screams with the ordinary liquid alarm note, frequently uttered. I often found it an unpleasant undertaking to rob a nest in the face of such unmistakable solicitude and remonstrance, and I would hurriedly leave the vicinity after the deed was

done, like some criminal, to escape further contumely. An "egg-hog" *does* sometimes feel conscience-smitten, as I am willing to admit.

The nest of the Varied Thrush is usually built close to the main trunk of a spruce, often directly against it, and supported by a clump of the stiff horizontal twigs or small branches. Sometimes the surrounding foliage renders the nest almost completely hidden from view. And then again, it may be supported by bare dead branches affording scarcely any screen. The majority of the nests are situated on the south sides of the tree-trunks, as probably being the warmest and driest side, and then too, strong, cold north winds are of frequent occurrence. All the nests which I have examined are very much alike in composition and structure. The foundation is a rather loose and bulky mass of plant stems, dry spruce twigs and grasses, but the nest proper is a solid, closely-felted structure. The bottom and sides are substantially formed of a mixture of mud, and wet, partly-decomposed grasses and moss. The amount of mud varies in different nests, and in some there is scarcely any; but the various vegetable materials are always incorporated when wet, so that after the structure dries, the walls and rim are very firm like *papier mache*. When finished the nest presents a neatly moulded, cup-shaped cavity, with an inner lining of fine dry grasses. The measurements of a typical nest are as follows: Inside diameter 3.25 inches; depth, 2.25. Outside diameter, 6.50; depth 4.50. The weights of the dry nests vary from one-half to one pound, depending on the amount of mud in their composition.

The earliest egg of the Varied Thrush was found on June 2, and on the 4th, a fresh set of three eggs was taken; on the 6th, a set of four, incubation slight. The latter seemed to be the average date of completion of the full set of eggs, although a slightly incubated set of four eggs, was taken as late as the 23rd of June. Of four sets of four each taken on the 11th, one was fresh and in three, incubation was well advanced. I secured eleven sets of the eggs of the Varied Thrush. There are two sets of

three, seven sets of four, and two sets of five eggs each, forty-four eggs in all. This series exhibits remarkable uniformity in size and coloring. The ground color is Nile blue, the exact tint varying somewhat, probably due to different terms of incubation and exposure to the light. The eggs are rather sparsely but evenly dotted and spotted with burnt umber and seal brown, with similar-sized "shell-markings" of ecru drab and vinaceous tints. The eggs of one set show larger blotchy markings of raw umber. One egg is almost without markings, thus resembling the robin's. There is a slight tendency toward a congregation of the markings at the larger ends, in some cases. In shape the eggs vary between ovate and short-ovate. The average measurements of the forty-four eggs are in inches, 1.18x.84. The largest egg measures 1.24x.88; the smallest, 1.10x.83.

In size and ground color the eggs of the Varied Thrush closely resemble those of the California Thrasher, but the spottings are fewer, finer and much darker. Taking every character into consideration, the Varied Thrush's eggs appear unique and not to be confused with those of any other North American bird with which I am acquainted.



IN the San Francisco *Chronicle* of Oct. 29, Mr. H. R. Taylor occupied a page with a delightful popular article on ornithology, with appropriate illustrations. Mr. Taylor has done much toward popularizing ornithology on the Coast by his frequent versatile, yet accurate, writings on birds.

ALL aspiring oologists in California who may have had designs upon the "first set" for the season have been thwarted by Mr. Grinnell's taking a set 1-3 Pasadena Thrasher on Dec. 15. And this so soon after Mr. Grinnell's return from eighteen months in the wilds of Alaska!

MR. CHAS. A. KEELER, well known as an ornithologist of ability, and author of "Evolution of Color in North American Land Birds," has recently issued a popular work under the title of "Bird Notes Afield," which is being well received on the Coast.